National Institute of Environmental Health Sciences

Increasing incidence of hemorrhagic fever with renal syndrome could be associated with livestock husbandry in Changchun, Northeastern China

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Abstract:

Background: Since the end of the 1990s, the incidence of hemorrhagic fever with renal syndrome (HFRS) has been increasing dramatically in Changchun, northeastern China. However, it is unknown which, and how, underlying risk factors have been involved in the reemergence of the disease.Methods: Data on HFRS cases at the county scale were collected from 1998 to 2012. Data on livestock husbandry including the numbers of large animals (cattle, horses, donkeys and mules), sheep, and deer, and on climatic and land cover variables were also collected. Epidemiological features, including the spatial, temporal and human patterns of disease were characterized. The potential factors related to spatial heterogeneity and temporal trends were analyzed using standard and time-series Poisson regression analysis, respectively.Results: Annual incidence varied among the 10 counties. Shuangyang County in southeastern Changchun had the highest number of cases (1,525 cases; 35.9% of all cases), but its population only accounted for 5.6% of the total population. Based on seasonal pattern in HFRS incidence, two epidemic phases were identified. One was a single epidemic peak at the end of each year from 1988 to 1997 and the other consisted of dual epidemic peaks at both the end and the beginning of each year from 1998 to the end of the study period. HFRS incidence was higher in males compared to females, and most of the HFRS cases occurred in peasant populations. The results of the Poisson regression analysis indicated that the spatial distribution and the increasing incidence of HFRS were significantly associated with livestock husbandry and climate factors, particularly with deer cultivation.Conclusions: Our results indicate that the re-emergence of HFRS in Changchun has been accompanied by changing seasonal patterns over the past 25 years. Integrated measures focusing on areas related to local livestock husbandry could be helpful for the prevention and control of HFRS.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Meteorological Factors, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Rural

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Zoonotic Disease

Zoonotic Disease: Other Zoonotic Disease

Zoonotic Disease (other): Hemorrhagic fever with renal syndrome

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified